

ABSTRACT

Title of Document: RELATIONSHIP OF YOGA EXPERIENCE TO
BODY SATISFACTION AND EATING
ATTITUDES

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Yoga, a mind-body exercise, may improve body dissatisfaction and decrease eating disorder symptoms among females by addressing four theories of antecedents to body dissatisfaction: internalization of the thinness ideal, social comparison theory, self-ideal discrepancy theory, and objectification theory. This study used a cross sectional survey to investigate whether there is a relationship between yoga experience among women and levels of antecedents to body dissatisfaction, body dissatisfaction and eating disorders symptoms. The results indicate that frequency of yoga practice is associated with a lower tendency to self-objectify. The data also indicate that a greater magnitude of lifetime practice of yoga is associated with body satisfaction. The data suggest that there may be a marginal relationship between a greater magnitude of lifetime yoga practice and actual-ideal discrepancies. These findings support the notion that historical yoga experience and shorter term intensity of yoga practice may be related to how women view their bodies.

RELATIONSHIP OF YOGA EXPERIENCE TO
BODY SATISFACTION AND EATING ATTITUDES

By

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Chapter One: Introduction

Purpose

The purpose of this thesis was to investigate whether yoga practice among women is associated with a higher degree of body satisfaction and lower degree of eating disorder symptomology. Additionally, this study investigated whether yoga practice is associated with lower levels of antecedents to body dissatisfaction, including internalization of the thinness ideal, tendency to compare their physical appearance to those of others, discrepancies between actual and ideal physical attributes, and self-objectification, or the tendency to consider one's body from an appearance-based perspective rather than from a competence-based perspective.

Daubenmier (2002) conducted a dissertation study to investigate whether yoga practice is associated with fewer antecedents to body dissatisfaction, greater body satisfaction and fewer symptoms of eating disorders, as compared to participation in aerobic classes or a baseline condition. Using a cross-sectional survey design, she found that yoga participants reported more favorably on all measures than aerobic exercise participants. The cross-sectional design does not permit causal inference. However, given that this study was one of the first to examine yoga's role on body dissatisfaction and eating problems and promising findings were observed, the present study further investigated these findings. This investigation tested the theories presented by Daubenmier on a sample of women to quantitatively determine if there was a dose-response relationship between degree of yoga experience and the dependent variables (internalization of the thinness ideal, tendency to compare one's physical appearance to

others, actual-ideal discrepancies, self-objectification, body dissatisfaction, and eating disorder symptomology).

Overview of the Problem

Eating concerns and disorders extend along a continuum ranging from mild dissatisfaction with one's body to serious eating disorders such as *anorexia nervosa*, *bulimia nervosa* and *binge-eating disorder* (Brown, 2005). Behaviors that lie on this continuum include normative dieting behaviors and more severe disordered eating such as binge eating and self-induced vomiting. Although engaging in unhealthy dieting or eating disordered behaviors may not be intense or frequent enough for a diagnosis of an eating disorder, these behaviors may lead to the development of a more severe eating disorder and may otherwise negatively impact health (Brown, 2005).

Body dissatisfaction has been found to be the most consistent risk factor for the development of eating disorders (Brown, 2005; Striegel-Moore, 1997). Body dissatisfaction and a preoccupation with physical appearance has also been suggested to interrupt cognitive processes, increase the experience of negative emotions, increase susceptibility to developing a mental disorder including depression and sexual dysfunction, and decrease self-esteem (Fredrickson and Roberts, 1997). Body dissatisfaction is experienced by the majority of American girls and women (Cash and Henry, 1995). This suggests a need for interventions to improve body satisfaction among women in order to improve mental health and prevent eating concerns and disorders.

The American culture promotes an idealized female body (Polivy and Hermann, 2002). The ideal female body portrayed in magazines, movies and television, and on

billboards is extremely thin (Daubenmier, 2002). This “thin ideal” that is promoted in America is difficult, if not impossible, for most women to achieve for genetic and health reasons. Therefore, this creates a conflict between culture and physiology with respect to the way women view their bodies.

While the American culture promotes an idealized body type, several theories have been suggested regarding the psychological mechanisms that lead to body dissatisfaction among females. These suggested antecedents to body dissatisfaction include internalization of the thinness ideal, social comparison, self-ideal discrepancy, and self-objectification.

Internalization of the thinness ideal theory (Heinberg, Thompson and Stormer, 1995) differentiates between *awareness* and *internalization* of the thin ideal. Internalization of the thin ideal is having the personal belief that the cultural thin body ideal for women is in fact most beautiful. The theory suggests that one can be aware that the thin ideal exists in American culture but may not believe that a thin body is more beautiful. According to another theory (Festinger, 1954), social comparison may be an antecedent to body dissatisfaction in that the more one tends to compare her physical appearance to the appearance of others, the more dissatisfied she may feel about her body. Self-ideal discrepancy theory (Cash and Szymanski, 1995) suggests that people set goals for themselves and periodically evaluate themselves against those goals. If, upon evaluation, a woman finds a discrepancy between her actual and ideal self, she may experience emotional distress, which may lead to body dissatisfaction. Finally, self-objectification theory (Noll and Fredrickson, 1998) says that one may objectify her body by viewing it in terms of its physical appearance, rather than regarding it based on how

the body feels or of what it is capable. The more one objectifies her body, the more she may experience body dissatisfaction.

Yoga, a form of mind-body exercise, has been proposed as an intervention that may be uniquely suited to reduce body dissatisfaction among females by addressing the four theories of antecedents to body dissatisfaction (Daubenmier, 2002). Yoga practice consists of a series of physical postures, called “asanas” that are integrated with a special form of breathing control, called “pranayama” (Feuerstein, 2001). Yoga also involves the mental practice of meditation with an umbrella goal of being fully present and accepting of one’s actual experience in a pose as it unfolds. The practice of yoga incorporates two principles: 1) self-acceptance and non-striving and 2) body awareness and trust. By practicing these principles through yoga, women may learn to become satisfied with their bodies and, in turn, improve their attitudes toward food.

Hypotheses

The present study investigated whether yoga practice among women is associated with a higher degree of body satisfaction and lower degree of eating disorder symptomology. It was predicted that women who reported a high degree of yoga experience would report more body satisfaction and fewer symptoms of eating disorders compared to women who reported a low degree of yoga experience. Participants’ reported levels of antecedents of body dissatisfaction was also investigated, including the degree to which women internalize the thinness ideal, the frequency with which they compare their physical appearance to those of others, the degree of discrepancy between their actual and ideal bodies, and the extent to which they self-objectify. It was predicted

that women who report a higher degree of yoga experience would report lower amounts of these antecedent variables compared to women reporting a lower degree of yoga experience. Specifically, the study explored the following research hypotheses:

Hypotheses 1: Participants who report a higher degree of yoga experience would report a lower amount of the antecedents associated with body dissatisfaction.

Specifically, it was hypothesized that the yoga practitioners would report (a) lower scores on a measure of the internalization of the thinness ideal, (b) less comparison of their physical appearance to those of others, (c) a lower discrepancy between their actual and ideal physical attributes, and (d) lower scores on a measure of self-objectification.

Hypothesis 2: Participants who report a higher degree of yoga experience would report a higher degree of satisfaction with their physical appearance.

Hypothesis 3: Participants who report a higher degree of yoga experience would report a lesser degree of symptoms of eating disorders.

Definition of Terms

Internalization of the Thinness Ideal is having the personal belief that the cultural thin body ideal for women is in fact most beautiful. *Internalization of the thinness ideal was measured using the Ideal-Body Stereotype Scale-Revised* (Stice and Agras, 1998).

Social Comparison is the tendency to compare one's physical appearance to that of others. *An individual's tendency to make Social Comparisons with respect to her body was measured using the Physical Appearance Comparison Scale* (Thompson, Heinberg and Tantleff, 1991).

Self-Ideal Discrepancy is the perceived discrepancy between actual and ideal body attributes. *Self-ideal Discrepancy was measured using the Body-Image Ideals Questionnaire* (Cash and Szymanski, 1995).

Self-Objectification is valuing one's own body more for its observable body attributes (appearance) than for its nonobservable body attributes (capabilities and sensations). *Self-objectification was measured by the Self-Objectification Questionnaire* (Noll and Fredrickson, 1998).

Body Dissatisfaction is defined as dissatisfaction with one's specific body parts (i.e., weight, hips, height) or one's overall appearance. *Body dissatisfaction was measured using the Body Areas Satisfaction subscale of the Multidimensional Body-Self Relations Questionnaire* (Cash, Winstead and Janda, 1986).

Eating Disordered Attitudes are defined as symptoms and concerns which are characteristic of eating disorders. These attitudinal factors fall among three categories: 1) dieting behavior (i.e., I feel extremely guilty after eating), 2) bulimia and food preoccupation (i.e., I have gone on eating binges where I feel I may not be able to stop) and 3) oral control (i.e., I avoid eating when I am hungry). *Eating Disordered Attitudes was measured by the Eating Attitudes Test (EAT-26)* (Garner, Olmsted, Bohr and Garfinkel, 1982).

Hatha Yoga is a form of yoga that involves a series of postures, integrated with a special form of breathing control, and meditation (Feuerstein, 2001). For the purpose of this thesis, the term “**hatha yoga**” was shortened to “**yoga**” throughout the paper.

Chapter Two: Literature Review

Eating Concerns and Disorders

Eating Disorders are one of the most common psychiatric disorders occurring in women and girls, with an incidence that has increased in the past 50 years (Polivy & Herman, 2002, Stice, 2002). A 2001-2003 survey of the US household population assessed the lifetime prevalence of eating disorders as ranging from 0.6 to 4.5% (Hudson, Hiripi, Pope & Kessler, 2007). Anorexia nervosa is the most severe condition on the continuum of eating disorders due to its impact on morbidity and mortality. This eating disorder is characterized by extreme weight loss with a refusal to maintain body weight over a minimal normal weight for age and height, poor body image, and irrational fears of weight gain and obesity. The estimated prevalence of anorexia nervosa among adolescent girls and young women is 0.2% to 1.0 %, with an estimated 10% to 15% of patients dying from their disease (Brown, 2005). Bulimia nervosa is an eating disorder characterized by the consumption of large amounts of food with subsequent purging by self-induced vomiting, laxative or diuretic abuse, enemas, and/or obsessive exercising. Whereas anorexia nervosa is characterized by severe weight loss, bulimia nervosa may show maintenance of weight or extreme weight fluctuations due to alternating binges and fasts. Prevalence estimates of bulimia nervosa range from 1.0% to 3.0% (Brown, 2005). About 90% of individuals with bulimia nervosa and anorexia nervosa are female. Binge-eating disorder (BED) is a condition in which one engages in eating large amounts of food and feels that these eating episodes are not within one's control (Brown, 2005). The prevalence of BED is greater among overweight clinical populations than among the

general population; 30% of overweight individuals have BED compared to 5% of females and 3% of males in the general population (Brown, 2005).

The Eating Attitudes Test (Garner et al, 1982) is a tool that is commonly used as a screening instrument for the presence of disturbed eating patterns (NEDSP, 2007). The tool measures three concepts which are related to particular symptoms of eating disorders (Garner et al, 1982). Garner et al (1982) describe the first concept as “dieting”, which relates to an avoidance of fattening foods and a preoccupation with being thinner. The second concept is “bulimia and food preoccupation” and measures thoughts about and preoccupation with food, as well as thoughts that are associated with bulimia such as the impulse to vomit after eating or otherwise purging the body of food eaten. The third concept is “oral control” and relates to self-control of eating and the perceived pressure from others to gain weight. Items on the scale relate to one of these three concepts and scores may be calculated for each of the concepts separately, or the items may be calculated together as a general indication of disturbed eating patterns.

Eating disorders are a public health concern because they can have potentially harmful physical and psychosocial consequences. These consequences include severe weight loss or weight gain, irregular menses, fainting episodes, constipation or diarrhea, hypothermia, loss of muscle mass, bone loss, tooth enamel demineralization, and depression. Severe consequences of eating disorders may even include death from weakened immune systems due to undernutrition, gastric ruptures, cardiac arrhythmias, heart failure, and suicide (Brown, 2005). Additionally, eating disorders are often associated with other psychopathology and are frequently under-treated. They are also

frequently associated with role impairment, or the interference with functioning in work, household, relationship and social roles (Hudson et al, 2007).

Eating pathology that does not meet the diagnostic criteria for a psychiatric disorder impacts a much larger proportion of the population with an estimate of approximately 10 to 25% of girls and young women being screened as having probable disordered eating patterns (Austin, 2000). Disordered eating patterns that do not formally meet the criteria for a diagnosis are of concern because they may lead to more severe eating disorders, and may also negatively impact physical and mental health (Brown, 2005).

Eating disorder prevention research is a young field that has made significant strides in the past twenty years, particularly in the last decade (Neumark-Sztainer, Levine, Paxton, Smolak, Piran, and Wertheim, 2006). Prior to 1994, only six prevention programs had been published in the literature. However, between 1994 and 2005, over 50 prevention programs were published and were reviewed by Neumark-Sztainer et al in 2006. Due to contradictory findings in the existing body of research, researchers in this field debate whether current prevention efforts are effective (Fingeret, Warren, Cepeda-benito, and Gleaves, 2006). A meta-analysis of the eating disorder prevention research (Fingeret et al, 2006) found that prevention programs had large effects on improving knowledge and small net effects on reducing disordered eating attitudes and behaviors. The vast majority of eating disorder prevention programs that have evaluated knowledge have shown positive effects (Neumark-Sztainer et al, 2006). Additionally, many evaluated programs produced improvements in knowledge and attitudes pertaining to body image (Neumark-Sztainer et al, 2006). However, there are only small effects for

lasting behavioral change. While lasting attitudinal and behavior improvements are the goal, Neumark-Sztainer et al (2006) suggest that the lack of maintained behavioral changes in this body of research should not undermine the field of prevention. Rather, a variety of interventions and environmental changes may be required to foster long-term behavior change. The researchers also suggest that the challenge of sustaining program effects following program termination should act to excite further research rather than deterring it. In light of these reviews on eating disorder prevention research, additional research is needed that may lead to lasting behavioral change.

Body Dissatisfaction

Many factors contribute to the onset of eating disorders and eating pathology. A factor that is closely linked with abnormal eating patterns is body dissatisfaction. Body dissatisfaction is dissatisfaction with one's specific body attributes (i.e., weight, hips, height) or one's overall appearance (Cash et al, 1986). Body dissatisfaction, independent of actual weight, has been found to be the most reliable risk factor for the development of disordered eating patterns (Striegel-Moore, 1997). In fact, body dissatisfaction has been identified as the first concern along a continuum of eating concerns and disorders (Brown, 2005).

Studies have found that body dissatisfaction is experienced by the majority of American girls and women, rather than being limited to a subset of females (Cash and Henry, 1995). Researchers have found body dissatisfaction to be experienced by many females, regardless of ethnicity, sexual orientation, or age. Hispanic and Asian-American women have been found to be dissatisfied with their bodies, sometimes more than whites

(Robinson, Killen, Litt, Hammer, Wilson, Haydel, Hayward and Taylor, 1996). While some studies suggest that African-American women are protected from the drive to be thin (Neff, Sargent, McKeown, Jackson and Valois, 1997), other studies show African-American women to be equally concerned with weight as White women (James, Phelps, LeAdelle and Andrea, 2001). Lesbians have also been found to experience body dissatisfaction and to feel discomfort with their dissatisfaction due to the conflict between feminist ideology that accepts all sizes and shapes, and the mainstream beauty ideal (Beren, Hayden, Wilfley, and Striegel-Moore, 1997). Finally, body dissatisfaction is experienced across all age groups, from girls to elderly women. More than 60% of adolescent girls experience body dissatisfaction and 40% consider themselves to be overweight (Brown, 2005). Women experience body dissatisfaction as well; one study (Allaz, Bernstein, Rouget, Archinard, Morabia, 1998) looked at women aged 30-74 years and found that 25% of the women were satisfied with their weight, whereas 71% wanted to be thinner even though 73% of them were at normal weight. Among women older than 65 years, 62% wanted to lose weight, 65% of them being at normal weight. Within the 5 years prior to the study, 42% of the women had dieted for weight control, including 67% at normal weight. Thirty-one percent of the women older than 65 years had also dieted, 62% of them being at normal weight. Another study (Mangweth-Matzek, Rupp, Hausmann, Assmayr, Mariacher, Kemmler, Whitworth, and Biebl, 2006) surveyed a randomly selected non-clinical sample of elderly women age 60-70 and found that over 60% of the women were dissatisfied with their bodies.

In light of the close link between body dissatisfaction and the development of abnormal eating patterns, these studies showing body dissatisfaction as a normative part

of the female experience is disturbing and calls for the need of interventions to improve body satisfaction among females. Additional consequences of body dissatisfaction and preoccupation with physical appearance include interruption of cognitive processes in that images of how their body appears may interrupt women's thoughts and actions, increases in the experience of negative emotions, susceptibility to developing a mental disorder including depression and sexual dysfunction, and decreased self-esteem (Fredrickson and Roberts, 1997).

What are the causes of body dissatisfaction in the American culture? Polivy and Hermann (2002) suggest that body ideals tend toward what is difficult to achieve since cultures of scarcity are much more likely to value rotundness as the ideal body shape, while the American culture, a culture in which food is abundant, values thin and idealized images of women. The "thin ideal" in American culture is portrayed in movies, on television, magazine covers and on billboards as having large breasts and muscle tone and is youthful and extremely thin (Daubenmier, 2002). This idealized body appears to be restricted to a monotonous image, one that seems impossible and unreasonable for most women to attain for genetic and health reasons. In 2004, 71 million Americans were actively dieting and the nation spent about \$46 billion on weight-loss products and services (Gibbs, 2006). In the opinion of the current author, the diet industry spends a large amount of money to successfully convince women that they can and should resemble this ideal female image.

While this idealized body type is promoted by the American culture, what are the psychological mechanisms that lead to body dissatisfaction among women? Daubenmier (2002) discussed four independent theories of these mechanisms which appear in the

literature that link the sociocultural environment to body dissatisfaction: internalization of the thinness ideal, social comparison theory, self-ideal discrepancy theory, and objectification theory.

Internalization of the Thinness Ideal. One may be exposed to and aware of the idealized images of female beauty but may or may not come to believe that a thin body is more beautiful. Researchers have developed scales that distinguish between awareness and internalization of the thin ideal and have found that internalization, but not awareness, is linked to body dissatisfaction (Heinberg, Thompson and Stormer, 1995, Cafri, Yamamiya, Brannick and Thompson, 2005). The conditions that make certain individuals more or less susceptible to internalization of the “thin body is beautiful” ideal have been suggested but not tested in the literature. Stice (1994) proposed that the beauty ideal is transmitted by the mass media, family members and peers through social reinforcement and imitation processes. This theory implies that the more individuals allow others to guide their values, the more likely they will be to internalize the thin ideal. Alternatively, the more confident individuals are in their own values, the less likely they will be influenced by the values of others. An alternative notion proposed by Lelwica (1999) suggested that all individuals are motivated to discover meaning and fulfillment in life, and that the images of the beauty ideal promise happiness and fulfillment. The fewer alternatives an individual has available to find happiness and fulfillment in life, the more likely she will internalize the thin ideal. However, if alternative meaning systems were available, or if women were able to experience happiness and fulfillment in their current bodies, they would be less likely to internalize the thin ideal.

Social Comparison Theory. Social Comparison Theory was originally proposed by Festinger (1954) and asserts that individuals have a basic need to evaluate themselves in order to gain self-understanding to act in consistent and effective ways; one way to do this is to compare oneself to others in the social environment. If one has a tendency to make an upward comparison (i.e., compares oneself to another who is better on some attribute), this may cause emotional distress and a decrease in self-esteem. Individuals differ on their tendency to make upward comparisons which leads certain individuals to be more vulnerable to body dissatisfaction. Indeed, researchers have found that the tendency to compare one's physical appearance with others is consistently correlated with greater levels of body dissatisfaction (Heinberg and Thompson, 1992a; Heinberg and Thompson, 1992b). This theory provides an explanation of how the thin ideal presented in the media may lead some girls and women to feel dissatisfied with their appearance.

Self-Ideal Discrepancy Theory. Self-ideal discrepancy theory proposes that people are motivated to set ideals for themselves, to attain those ideals, and to occasionally evaluate the discrepancy between their actual and ideal self (Cash and Szymanski, 1995). The greater the discrepancy one finds upon evaluation, the greater the emotional distress and dissatisfaction an individual will experience. Researchers have found self-ideal discrepancies in physical appearance to be strongly correlated with body dissatisfaction (Cash and Szymanski, 1995). Sometimes the perceived discrepancy between one's actual and ideal self is based on an individual's overestimation of her physical weight. Body size overestimation is regularly shown to be associated with

diagnosed eating disorders, especially among relatively thin women (Conley and Boardman, 2007).

Objectification Theory. Finally, self-objectification may lead to body dissatisfaction. Individuals' views of their bodies are multidimensional, including both observable (i.e., weight, firm/sculpted muscles, sex appeal) and nonobservable (i.e., health, strength, energy level) physical characteristics (Noll and Fredrickson, 1998). Self-objectification is defined as valuing one's own body more for its observable attributes than for its nonobservable body attributes. For instance, a woman who values the look of her sculpted muscles more than she values the strength imparted by her muscles is self-objectifying. Self-objectification leads to preoccupation with monitoring the body's outward appearance, rather than monitoring how one's body feels or of what one's body is capable. This theory argues that the more one self-objectifies, the more opportunities one has to experience body dissatisfaction. Noll and Fredrickson (1998) surveyed two samples of undergraduate women regarding self-objectification, body shame, eating disorder symptoms, and dietary restraint. They found that individuals vary in their level of self-objectification and it has been related to body shame (Noll and Fredrickson, 1998).

Mind-Body Exercise and Yoga

In order to improve women's body satisfaction, mind-body exercise, such as yoga, has been proposed as an intervention (Daubenmier, 2002). Traditional exercise in America may be thought of as body-oriented exercise in that the focus is on the development of the physical body through strength training and aerobic exercise.

Alternatively, mind-body exercise may be distinguished from body-oriented exercises in that it combines muscular activity with a mindful awareness of bodily sensations, breath and energy, which is internally directed. Mind-body exercise is process-oriented, in that emphasis is placed on turning attention to what the body is doing as it is doing it, thereby enabling participants to experience their bodies directly. Mind-body approaches to health assume that the body is an intelligent organism, customized to establish and preserve health; the main role of the mind is to listen to and respond accordingly to the body's signals while continual interruption of the connection between mind and body results in dysfunction (Kabat-Zinn, 1990). Therefore, this mind-body approach to exercise may be particularly well-suited to address women's body dissatisfaction from the standpoint of objectification theory, since the focus is on listening to how the body feels during exercise, as opposed to a focus on the resulting outward appearance of the body.

Yoga is one such mind-body exercise which incorporates a series of physical postures developed by experienced meditators living in India thousands of years ago as an outgrowth of their meditation practice (Feuerstein, 2001). The physical postures practiced are called "asanas" and they are integrated with a special form of breathing control, called "pranayama" (Feuerstein, 2001). Yoga also involves the mental practice of meditation ("dhyana") with an umbrella goal of being fully present and accepting of one's actual experience in a pose as it unfolds. The term "yoga" is a spiritual term meaning union (Feuerstein, 2001), and refers to the union of one's personal experience with the "Ultimate" or God, or all that is. To attain this union, principal importance is placed on mindful attention to one's unfolding present-moment experience. Therefore, the practice of yoga in modern society takes many different forms including mental,

spiritual, and physical, but it still maintains its main purpose which is quieting the mind and the sensory system as a means to enlightenment (Feuerstein, 2001).

Yoga has experienced a recent increase in popularity in the United States, and has accompanied the general increase in use of Complementary and Alternative Medicine (CAM). A 1990-1997 study (Eisenberg, Davis, Ettner, Appel, Wilkey, Van Rampay, and Kessler (1998) surveyed a randomly selected national sample through household telephone calls and found a 47.3 percent increase (approximately 629 million visits) in total visits to Alternative Medicine practitioners. The study also found a significant increase in the use of herbal medicine, massage, vitamins, homeopathy, and energy healing therapies. This study did not survey participants regarding yoga practice, but it was one of the first studies to investigate the use of CAM. The survey also found that use of CAM varies demographically. For example, CAM users were typically women, college-educated, younger, and had higher incomes.

A 1997-2002 survey (Tindle, Davis, Phillips, and Eisenberg, 2005) on CAM trends included yoga practice and found that the largest relative increase in CAM use for the time-frame of the study was for herbal usage and yoga practice. Yoga practice among Americans increased from 3.7 percent of the population in 1997 to 5.1 percent in 2002. The use of CAM again varied demographically in this survey, with women, non-black, non-Hispanic individuals, age 40-64, and individuals earning higher incomes using CAM the most.

In 2004, a national survey investigating the prevalence and patterns of yoga practice in particular was published and found that 7.5 percent of Americans used yoga at least once in their lifetime, with 3.8 percent of Americans practicing yoga in the past year

(Saper, Eisenberg, Davis, Culpepper, and Phillips, 2004). In this study, yoga practitioners were more often female, ages 40-64, educated beyond high school, resided in urban areas, and were more likely to use other forms of CAM therapy. The survey also found that during the past year, 64% of yoga practitioners used yoga for wellness, and 48% used it for health conditions such as back or neck pain. Ninety percent of yoga practitioners believed that yoga was very or somewhat helpful and over three-fourths of participants did not report any expenses related to yoga.

The research regarding the psychological effects of yoga is still in its infancy, yet some positive effects have been suggested in the literature with regard to improving work performance by relieving tension and job stress (Taylor Gura, 2002), reducing perceived stress among undergraduate college students (West, Otte, Geher, Johnson and Mohr, 2004), and increasing impulse control among adolescent sex offenders (Derezotes, 2000). With respect to body satisfaction, Clance, Mitchell and Engelman (1980) showed positive effects on body satisfaction from a body awareness training program for children. The program involved focusing on the sensory awareness of targeted body parts, as well as practicing yoga postures. The researchers found that the program improved body satisfaction among participants.

One recent and particularly promising study (Daubenmier, 2002) used a cross-sectional design to investigate whether yoga practice was associated with fewer antecedents to body dissatisfaction, greater body satisfaction and fewer symptoms of eating disorders, as compared to participation in aerobic classes or a baseline condition. The researcher surveyed 138 women who were already practicing yoga, aerobics, or another type of body-oriented exercise. The survey asked women questions regarding

internalization of the thinness ideal, social comparison, self-ideal discrepancy, self-objectification, body awareness and trust, body satisfaction and symptoms of eating disorders. The study found that yoga participants reported more favorably on all measures. Yoga participants also reported greater body awareness and trust during exercise and daily life than aerobics participants or other body-oriented exercise participants. Daubenmier (2002) theorized how yoga may increase women's body satisfaction by discussing two principles of yoga: 1) self-acceptance and non-striving and 2) body awareness and trust.

Self-acceptance and non-striving. Yoga may appear at first glance to involve striving to improve a posture by imitating a teacher's demonstration of poses, observing other students, or by focusing on an idealized image of the pose in one's mind. However, if an idealized image of a pose is the goal of one's practice, a yoga practitioner will not evolve in her practice. Rather, experienced practitioners realize that they must be aware of what is actually happening in the pose to evolve. Daubenmier (2002) explains the experience:

"It is precisely when they surrender to their place in the pose rather than try to force or push it, that the pose progresses and deepens. As awareness is brought into tight or uncomfortable areas of the body with an attitude of acceptance, a spontaneous release of physical tension occurs that allows the body to move more deeply into the pose. Ironically, Hatha yoga teaches that, through non-striving and acceptance of one's limitations, one is able to move beyond them" (p. 16).

One frequent concept practiced in yoga is the concept of "letting go," or acceptance (Daubenmier, 2002). Yoga practitioners practice letting go of their interpretation of reality, in other words to let go of all thoughts, judgments, emotions, so they can experience their bodies directly. However, letting go does not mean withdrawing from one's experience; rather letting go is fully engaging one's experience, but letting go of

one's interpretation of that experience. Therefore, the umbrella goal of yoga is to be fully present and accepting of one's actual experience in the pose as it unfolds. In order to promote this concept of self-acceptance and non-striving, yoga teachers often encourage students to explore one's limit, to explore their mental and emotional reactions to being at that limit, and to let go of those reactions to simply accept where they are in the pose. Teachers may address the students' tendencies to compare themselves to others by explaining that yoga practice is not a competition and that wherever the student is in the pose at that moment is exactly where she needs to be.

Body awareness and trust. In yoga, Daubenmier (2002) explains that though poses are held for a period of time, the body remains in constant motion. The breath is viewed as the initiator of movement, constantly moving the body, while muscles relax and loosen, changing the shape of the pose. Yoga practitioners are encouraged to be aware of this continual process and to pay attention to bodily sensations as a guide to movement rather than using a teacher or mirrors as a guide. By using the bodily sensations as a guide, one is tuning in to the natural intelligence of the body and can then respond to the body's needs. This develops one's sense of trust in the body that what feels good is good. A baby has a keen sense of awareness and trust in her bodily sensations in that she knows when she is hungry or full. However, this awareness of and trust in the body is an ability that many of us lose, for various reasons, as we age. Yoga allows individuals to practice this body awareness and trust in order to recover the innate wisdom of their bodies. As mentioned earlier, Daubenmier (2002) found that yoga practice was associated with greater body awareness and trust during yoga practice as well as in daily life.

Potential Role of Yoga in Women's Body Dissatisfaction and Eating Concerns

Yoga may have unique implications for women's body dissatisfaction and eating concerns, as suggested by Daubenmier (2002). In order to understand how the practice of yoga may influence body satisfaction, the antecedents to body dissatisfaction will be discussed in relation to the principles of yoga.

Internalization of the Thinness Ideal. As mentioned earlier, one mechanism thought to influence the extent to which one internalizes the thinness ideal is social reinforcement and imitation processes; the more one allows others to guide her values, the more she will internalize the thinness ideal. By focusing on one's own bodily sensations and responding accordingly, one can become conscious of an alternative knowledge base which can serve as a foundation for her values, attitudes and behavior with respect to her body. An increase in trust in one's own bodily sensations may lead to decreased anxiety from valuing an ideal that may be difficult or impossible to attain. Additionally, women may feel a sense of empowerment from basing their perceptions on their own inward experience, rather than on the opinions of others. The decrease in anxiety and sense of empowerment would feel good in the body, thereby allowing women to experience happiness and fulfillment in their current bodies. According to the theory proposed by Lelwica (1999) as explained previously, this newfound happiness and fulfillment in women's current bodies would lead to a decrease in internalization of the thin ideal and greater body satisfaction.

Social Comparison Theory. As noted earlier, individuals who tend to compare themselves with others experience greater body dissatisfaction. Therefore, if one could

decrease the tendency to compare herself to others, she may become more satisfied with her body. In yoga, the emphasis on accepting one's internal experience and letting go of any thoughts or judgments regarding one's limits, may allow individuals to release the need to compare themselves to others. Indeed, yoga instructors encourage students to let go of any competitive urges they may feel. Additionally, by becoming aware of the internal experience of the body, the tendency to focus outward diminishes. As Festinger (1954) argues, individuals have a basic need to evaluate themselves in order to gain self-understanding to act in consistent and effective ways. As one develops body awareness and trust, one may realize that social comparison is not the only way to gain self-understanding. Rather, one may find that trust in one's own body will lead to a more helpful and dependable foundation for behavior.

Self-Ideal Discrepancy Theory. The importance placed on self-acceptance and non-striving in yoga may help women to relax their concepts of their ideal physical self and to accept their current self. In her comparison of women who practice yoga to women who practice body-oriented exercise, Daubenmier (2002) found yoga participants reported the smallest discrepancies between actual and ideal physical attributes.

Objectification Theory The emphasis placed on mindful awareness of the body in yoga may promote different ways of thinking about the body other than physical appearance. The increases in flexibility, strength and balance may allow women to take pride in the way their body feels and what it is capable of, rather than what their body looks like. The focus on breathing also calls attention to the value of internal self-regulatory processes and allows women to value their body from a first-person perspective. Additionally, rather than focusing on observable body attributes, women can

continually experience their bodies as a source of information that can be trusted, thereby providing opportunities to increase body satisfaction.

Disordered Eating. The principle of body awareness and trust may positively influence women's eating habits. Researchers (Heilburn & Worobow, 1991) have found that inattention to satiety cues is a risk factor for the development of eating disorders and that this insensitivity is a generalized insensitivity to internal body sensations that extend beyond hunger satiety. Therefore, the practice of listening to one's internal body sensations with trust and responding accordingly, as yoga practitioners have the opportunity to practice, may lead to the ability to trust one's body sensations regarding hunger and satiety, which would lead to healthier eating patterns. Additionally, the concept of self-acceptance and letting go of thoughts, judgments and emotions may be beneficial to women who binge eat. Heatherton and Baumeister (1991) theorized that binge eating is motivated by a desire to escape from self-awareness; binge eaters may attempt to narrow their attention to the immediate stimulus environment to avoid negative thoughts. Yoga teaches individuals to fully accept their experience without judgment and stay with painful feelings without acting on their impulsive urges. Women may also practice letting go of negative thoughts and feelings that trigger binge eating.

Present Study The present study explored whether a higher degree of yoga experience is associated with lower self-reported antecedents to body dissatisfaction, higher body satisfaction, and lower eating disorder symptomology among women.

Chapter Three: Methods

Introduction

This study used a cross-sectional survey to investigate the relationship of yoga experience to self-reported antecedents to body dissatisfaction, body satisfaction, and eating disorder symptomology among women over age eighteen.

Sampling design

Recruitment Participants were recruited to complete a survey on “Women and Body Satisfaction”. In an effort to recruit participants with varied yoga experience ranging from women who have never practiced yoga to highly experienced yoga practitioners, participants were recruited through two different methods. The first recruitment method was purposeful sampling, with the intent to recruit women who represented a wide range of yoga experiences from beginning to advanced. They were solicited from yoga classes held at two governmental agencies, as well as two independent yoga studios. Permission was sought from the owners of the yoga studios, or the person responsible for managing yoga classes at the governmental agencies, to administer the survey in classes, and at the studio reception desks. Yoga instructors at the yoga studios were also solicited to complete the survey in order to obtain participants with a high level of yoga experience. The second recruitment method was snowball sampling, with the intent to recruit women with no yoga experience, as well as more women with a range of yoga experiences. The researcher solicited personal acquaintances to distribute surveys to their own personal acquaintances. These participants were

requested to complete the survey and anonymously return the survey through the mail or other means.

Power Calculations Power calculations were conducted to obtain the minimum number of participants needed to respond to this survey in order to find significant difference in the main outcome measures. The main outcome measures were total scores on 6 scales: the Ideal-Body Stereotype Scale-Revised, the Physical Appearance Comparison Scale, the Body Areas Satisfaction Subscale (BASS) of the Multidimensional Body-Self Relations Questionnaire, the Body-Image Ideals Questionnaire (BIQ), the Eating Attitudes Test (EAT-26), and the Self-Objectification Questionnaire. These scales are described later in this chapter.

Using recommendations for power calculations by Faul, Erdfelder, Lang, and Buchner (2007), two types of power calculations were conducted. The first type of power calculation was conducted for use in an analysis to compare mean scores between two groups. Searching for a medium effect size (0.5), we needed a minimum sample size of 48 in one group and 96 in the second group. The second type of power calculation was conducted for use in correlational analysis. Searching for a medium effect size (0.3) for use in correlation analysis, we needed a minimum sample size of 82 respondents. These sample size values were calculated for two-tailed tests with a Power of .80 and alpha equal to .05.

Inclusion/Exclusion Criteria Participants were included in the survey administration if they were female and eighteen years of age or older. Participants were excluded from the survey if they were male, or under eighteen years old.

Data Collection Procedure

Survey Administration The author explained the survey administration to potential participants verbally and/or through the cover letter of the survey instrument (Appendix B, page 61). For participants recruited from yoga classes, the author explained the survey administration to the classes. For participants recruited through the snowball method, the author explained the survey administration to the distributors of the survey. The author explained that the survey was being conducted as part of a Master's Thesis project through the University of Maryland on body dissatisfaction among women. Potential participants were informed that they were being asked to participate in the study because they were women aged 18 years of age or older. Participants were told that the purpose of the research project was to explore new questions about how women think about their bodies as well as themselves more generally. Since the survey was anonymous, participants provided their implied consent through completion of the survey.

The survey instrument was comprised of seven short sections. The names of the sections were not included on the survey itself, but there were indications where each section began and ended. The sections of the survey were as follows: (1) the Ideal-Body Stereotype Scale-Revised, (2) the Physical Appearance Comparison Scale, (3) the Body Areas Satisfaction Subscale (BASS) of the Multidimensional Body-Self Relations Questionnaire, (4) the Body-Image Ideals Questionnaire (BIQ), (5) the Eating Attitudes Test (EAT-26), (6) the Self-Objectification Questionnaire, and (7) a Yoga experience and participant characteristics section. Names of the participants were not placed anywhere on the survey instrument.

Measures

Internalization of the Thinness Ideal (page 62, items 1-6) The Ideal-Body Stereotype Scale-Revised (Stice and Agras, 1998) was used to measure internalization of the cultural thin body ideal for women. Participants rated how much they agree with six statements regarding what attractive women look like, for example, “Slender women are more attractive,” on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The six items were averaged to form an overall measure of ideal-body internalization. The range of scores is 1 to 5 with a lower score indicating a lower degree of internalization of the thin body ideal. The scale has demonstrated acceptable internal consistency (Cronbach’s $\alpha = .83$) and test-retest reliability ($r = .80$) as well as convergent and predictive validity when used among adolescent females (Stice and Bearman, 2001). The scale also demonstrated a Cronbach’s α coefficient of .86 in a study of adult female yoga and aerobic exercise practitioners (Daubenmier, 2002), similar to the population being sampled in the present study. Cronbach’s α for the present study was .75.

Social Comparison (page 62, items 7-9) The Physical Appearance Comparison Scale (as cited in Daubenmier, 2002) was developed to measure the tendency of college students to compare their physical appearance to that of others when at parties or other social events; it was specific to a college student population. Daubenmier (2002) modified the scale for use across a wider range of situations and eliminated two of the five items because they did not directly assess the tendency to compare oneself to others. The modified scale included the following items: 1) I compare my physical appearance to

the physical appearance of others, 2) I compare how I am dressed to how other people are dressed, and 3) I compare my figure to the figures of other people. Responses were measured on a 5-point Likert scale ranging from 1 (never) to 5 (always). The three items were averaged to provide an overall tendency for physical appearance comparison. The range of scores is 1 to 5 with higher scores indicating a tendency to compare oneself to others more often. Daubenmier's (2002) modified scale was shown to have a sufficient internal consistency (Cronbach's $\alpha = .81$) among adult female yoga and aerobic exercise practitioners and was used to measure the tendency to compare one's physical appearance to that of others in the present study. The scale demonstrated sufficient internal consistency (Cronbach's $\alpha = .86$) in the current study.

Body Satisfaction (page 63, items 10-17) The Body Areas Satisfaction Subscale (BASS) of the Multidimensional Body-Self Relations Questionnaire (Cash et al, 1986) was used to measure body satisfaction of participants in the present study. Satisfaction with one's body areas was assessed using the nine item scale. Responses were recorded on a 5-point scale ranging from 1 (very dissatisfied) to 5 (very satisfied) regarding satisfaction with face, hair, lower torso, midtorso, upper torso, muscle tone, weight, height, and overall appearance. The items were averaged to provide an overall measure of body satisfaction. The range of scores was 1 to 5 with higher scores being indicative of greater body satisfaction. Cronbach's α of the BASS was .73 in females, and the 1-month test-retest correlation was .74. Cronbach's α in the present study was .66.

Actual-Ideal Discrepancies (page 63, items 18-27) Perceived discrepancy between actual and ideal body attributes was measured using the Body-Image Ideals Questionnaire (BIQ) (Cash and Szymanski, 1995). The initial version of the BIQ

included 10 physical characteristics: height, skin complexion, hair texture and thickness, facial features, muscle tone and definition, body proportions, weight, chest (or breast) size, physical strength, and physical coordination. For each attribute, participants were asked to think about how they actually are and then to think about how they wish they were. They rated the extent to which they resemble or match this personal physical ideal on a 4-point response scale: 0 = “exactly as I am,” 1 = “almost as I am,” 2 = “fairly unlike me,” 3 = “very unlike me.” The scoring of the BIQ involved computing the average of the 10 items. The range of scores was 0 to 3 with higher scores indicating greater self-ideal disparities. The initial validation study of the BIQ was conducted with 284 college women and provided evidence of the reliability of the scale; Cronbach’s alpha of the scale was .75 (Cash and Szymanski, 1995). In the current study, Cronbach’s alpha was .73.

Eating Disorder Symptomatology (page 64, items 28-53) Cognitions, emotions, and behaviors associated with anorexia and bulimia nervosa were measured using a 26-item scale, the Eating Attitudes Test (EAT-26) (Garner et al, 1982). Responses were measured on a 6-point scale ranging from 1 (never) to 6 (always). Scores were averaged to provide an overall measure of eating disorder symptomology. The range of scores was 1 to 6 with lower scores indicating fewer symptoms of eating disorders. A previous study testing eating attitudes using the EAT-26 scale reported mean scores of 2.20, 2.54 and 2.26 for yoga participants, aerobic class participants and other body-oriented exercise participants, respectively (Daubenmier, 2002). The measure has been shown to consist of three subfactors: bulimic symptomatology, dieting behavior, and anorexia nervosa symptomatology. The original scale (EAT-40) was abbreviated to include only 26 items;

the EAT-26 is highly correlated with the EAT-40 ($r=.98$) and demonstrated internal consistency of .90 (Garner et al, 1982). The EAT-26 scale is a widely used standardized measure of symptoms associated with eating disorders and is used by the National Eating Disorders Screening Program (NEDSP, 2007). The internal consistency in the present study was demonstrated to be .87.

Self-Objectification (page 65) The Self-Objectification Questionnaire (Noll and Fredrickson, 1998) was used to quantify individual differences in self-objectification. This questionnaire assesses the extent to which participants view their bodies in observable, appearance-based terms versus non-observable, competence-based (nonobjectified) terms. The questionnaire was demonstrated to have satisfactory construct validity in two samples of undergraduate women ($N = 93$, $N = 111$) who completed self-report questionnaires assessing self-objectification, body shame, anorexic and bulimic symptoms, and chronic dieting (Noll, 1997). Scores on the questionnaire correlated positively with scores on two related questionnaires; the Appearance Anxiety Questionnaire ($r=.2$, $p < .01$) and the Body Image Assessment ($r=.46$, $p < .01$) (Noll, 1997). The Appearance Anxiety Questionnaire assesses preoccupation with observable aspects of the physical self, while the Body Image Assessment measures individuals' body size dissatisfaction. The correlations suggest that the Self-Objectification Questionnaire assesses preoccupations with appearance, yet is not equivalent to the two related constructs. Participants ranked in ascending order a list of body attributes in terms of how important each attribute is to their physical self-concept. The original instructions of the measure were "When considering your physical self-concept, how important is...", but to clarify the meaning of the question, instructions were changed to "When you think

about your body, how important is..." (Daubenmier, 2002). Ten body attributes were listed: five that are appearance based (weight, sex appeal, physical attractiveness, firm/sculpted muscles, and measurements (i.e., chest, waist, hips)) and five that are competence based (physical coordination, health, strength, energy level (i.e., stamina), and physical fitness level). Scores were computed by summing the ranks for the appearance and competence attributes separately (the highest rank received a score of nine, second highest an 8, etc, and least important body attribute received a 0). Then, the appearance-based score were subtracted from the competence-based score. Scores could range from -25 to +25 with higher scores indicating a greater tendency to view one's body in appearance-based terms. Cronbach's alpha could not be calculated for the Self-Objectification scale due to the scale properties.

Yoga Experience Section (page 66, questions 1-4) Questions 1 through 4 asked participants about their experience with yoga. Quantitative measurements of yoga experience are non-existent in the literature; therefore the author developed a variety of perspectives to measure yoga experience. Yoga experience was operationally defined from four perspectives, each represented by one of the four questions.

The first two questions ("In your lifetime have you ever used yoga?" and "Have you used yoga in the past 12 months?") were used in a national survey of prevalence and patterns of adult yoga use (Saper et al, 2004). This first question operationally defined respondents into two groups: those who have never practiced yoga (coded as 1) and those who have ever practiced yoga in their lifetimes (coded as 2). If participants responded "no" to the first question (indicating that they have never used yoga), they therefore were

not asked to respond to any of the questions pertaining to the specifics of their yoga practice.

The second question operationally defined a subset of respondents (those who have ever practiced yoga in their lifetimes) into past yoga users and current yoga users. If participants responded “no” to the second question (indicating they have not used yoga in the past 12 months), they were designated as past yoga users (coded as 1) and therefore were not questioned about their current yoga practice. Those participants responding “yes” to the first two questions were operationally defined as current yoga practitioners (coded as 2).

The third and fourth questions operationally defined yet a further subset of respondents (those who are current yoga practitioners) in two different ways: length of time (in months) that they have practiced yoga in their lifetime and the average frequency (number of sessions per month or week) that they practice yoga. Since question 3 asked participants for their response in years and months, the author converted all year responses into months in order to maintain consistency of units. The months were coded as 1, 2, 3, etc. to designate 1 month, 2 months, 3 months, respectively. Question 4 asked participants about the frequency with which they practice yoga. Since there is no measure in the literature which measures frequency of yoga practice, the author developed a measure using exercise guidelines established by the American College of Sports Medicine as a model (Adams, Moore and Dye, 2007). The exercise guidelines measure vigorous or moderate exercise in terms of days per week as follows: 0 days per week, 1 to 2 days per week, or ≥ 3 days per week. For the present study, the author used “days per week” of yoga practice as in the exercise guidelines, but changed the categories to

include more options at the lower end of frequency. This is because the author wanted to explore whether individuals who practice yoga on a biweekly or once/twice monthly basis may still obtain a benefit. Therefore, question 4 operationally defined frequency of yoga practice as follows: less than 1 day per month (coded as 1), 1 to 3 days per month (coded as 2), 1 to 2 days per week (coded as 3), 3 to 4 days per week (coded as 4), 5 to 6 days per week (coded as 5), or 7 days per week (coded as 6).

Participant Characteristics Section (page 66, questions 5-9) Question 5 asked participants about current practice of other forms of alternative medicine, a possible confounder. Questions 6 through 9 asked participants their age, weight, height, and race. Weight and height were used to compute participants' BMI. Alternative medicine practice, age, BMI and race were controlled for as covariates in the analysis, described later in this chapter.

Pilot Testing

Eight women were recruited to pilot test the survey instrument. None of the women reported finding the items in the questionnaire to be offensive in language. While some of the women thought that the topic was sensitive, all of the women agreed that the anonymous nature of the survey would ease any participants who thought the survey was invasive or too personal. The mean time of the participants to complete the entire questionnaire was 11 minutes, with a range of 10 to 15 minutes. The survey was modified to make the instrument easier to use and more clearly worded. Scales were included at the top of each page if items continued onto a second page. The instructions for items 18-27 were condensed to avoid wordy phrases that some pilot testers found

confusing. Instructions were added for items 28 through 53 to indicate that frequency of thoughts or action was requested.

Analyses

The participants in the study were categorized into one of three groups, depending on their experience with yoga. Participants who had never practiced yoga were categorized into the never yoga group. Participants who had practiced yoga in their lifetimes, but not in the past 12 months were categorized into the past yoga group, and those who had practiced yoga in the past 12 months were designated as the current yoga group. Participants who are either current or past yoga practitioners were sometimes categorized together as the ever yoga group in these analyses because they have practiced yoga at some point in their lifetimes. For all psycho-social variables tested in this study, the mean value was calculated for each of the yoga groups (never, ever, past and current). The mean value for each yoga group was also calculated for all covariates (BMI, activity level, age, highest level of education, number of alternative medicine types practiced, and race).

For each hypothesis, two classes of analyses were conducted, including independent groups *t*-test and correlational analysis. First, the independent groups *t*-test was conducted to compare mean scores between groups. The independent groups *t*-test was used to compare mean scores of the psycho-social variables (internalization of the thinness ideal, social comparison, actual-ideal discrepancies, self-objectification, body satisfaction, and symptoms of eating disorders) among women from the never yoga group with those from the ever yoga group. Likewise, the independent groups *t*-test was used to

compare mean scores of the psycho-social variables among women from the never yoga group with those from the current yoga group. The second class of analysis was correlational to determine the relationship of psycho-social variables to yoga experience among women within the current yoga group. Correlational analysis was used to elucidate the relationship between the psycho-social variables and the number of months that current yoga users have practiced in their lifetimes, and between the psycho-social variables and current yoga users' frequency of practice in terms of number of sessions per month or week. The scale used to measure frequency of practice was ordinal rather than interval.

For each class of analysis (comparison of mean scores and correlational), a second set of analyses were conducted to control for confounding variables (see covariates listed above). The author described the analyses without the covariates first so the reader could observe the effect that adjusting for covariates had on the analyses.

Chapter Four: Results

Description of Sample

Two-hundred and twelve female participants completed the survey. Some participants did not complete every item on the survey resulting in slight variability in the number of cases for each variable. Of 209 respondents that answered items relating to their yoga experience, 54 (26%) had never practiced yoga, 46 (22%) had practiced yoga in their lifetime but not in the previous 12 months, and 109 (52%) were current practitioners of yoga.

Participants reported varying degrees of activity levels. Ten percent (n=21) reported their activity level as sedentary, defined as little or no exercise. Most respondents reported being lightly active one to three days per week (38%, n=79) or moderately active three to five days per week (42%, n=86). Nine percent (n=18) reported very active lifestyles with hard exercise six to seven days per week, and only 3 respondents (1.5%) reported being extra active with very hard daily exercise and a physical job or physical training two times per day.

The sample of women surveyed in this study ranged in age from 19 to 74 years old, with about two-thirds of the sample being between the ages of 25 and 44 years old. The majority of the sample were educated holding either a bachelor's degree (29%) or advanced degree (58%) and 84% of the women were White.

The Body Mass Index (BMI) for each participant was calculated using their self-reported weight and height measurements. The majority of participants were of normal weight (69%) or overweight (20%) using the BMI categories of 18.5-24.9 or 25-29.9, respectively. Nine percent of the women were obese (BMI over 30), and 1.5% were

underweight (BMI less than 18.5). The participants reported varying degrees of experience with other forms of alternative medicine besides yoga. Seventeen percent had never tried any alternative medicine practices, while 15% had practiced five or more different forms of alternative medicine.

Table 1 (page 38) provides a summary of the characteristics of this sample with respect to yoga experience, activity level, age, BMI, number of alternative medicine types practiced, highest level of education completed, and race.

Description of Yoga Groups

Tables 2, 3, 4, and 5 (page 39-41) provide a description of results for the yoga groups with regard to the main outcome measures and covariates. Table 2 (page 39) provides the mean values of the covariates (BMI, activity level, age, highest level of education, number of alternative medicine types practiced, and race) for each yoga group. Table 3 (page 40) provides the mean values of the psychosocial variables (internalization of the thinness ideal, social comparison, actual-ideal discrepancies, self-objectification, body satisfaction, and symptoms of eating disorders) for each yoga group. Table 4 (page 41) provides a frequency table for current yoga participants' responses to being asked the number of months they have practiced yoga in their lifetime. Table 5 (page 41) provides a frequency table for current yoga participants' frequency of practice in terms of number of sessions per month or week.

Table 1
Characteristics of Sample

	Percent	N	Mean	Standard Deviation
<i>Yoga Experience</i>		209	N/A	N/A
<i>Never</i>	25.84	54		
<i>Past</i>	22.01	46		
<i>Current</i>	52.15	109		
<i>Activity Level</i>		207	2.53	0.85
<i>1=Sedentary</i>	10.14	21		
<i>2=Lightly Active</i>	38.16	79		
<i>3=Moderately Active</i>	41.55	86		
<i>4=Very Active</i>	8.70	18		
<i>5=Extra Active</i>	1.45	3		
<i>Age</i>		210	39.19	12.57
<i>18-24</i>	5.71	12		
<i>25-34</i>	40.95	86		
<i>35-44</i>	21.43	45		
<i>45-54</i>	16.67	35		
<i>55-64</i>	11.43	24		
<i>≥ 65</i>	3.81	8		
<i>Body Mass Index</i>		206	24.14	4.56
<i>< 18.5</i>	1.46	3		
<i>18.5-25</i>	68.93	142		
<i>25-30</i>	20.39	42		
<i>30-35</i>	6.31	13		
<i>35-40</i>	0.97	2		
<i>> 40</i>	1.94	4		
<i>No. of Alternative Medicine Types Practiced</i>		208	2.58	2.15
<i>None</i>	17.31	36		
<i>1</i>	12.98	27		
<i>2</i>	26.44	55		
<i>3</i>	17.31	36		
<i>4</i>	11.06	23		
<i>≥ 5</i>	14.90	31		
<i>Highest Level of Education</i>		210	5.32	1.01
<i>High School Diploma</i>	1.90	4		
<i>Some College</i>	8.10	17		
<i>Associate Degree</i>	3.33	7		
<i>Bachelor Degree</i>	28.57	60		
<i>Advanced Degree</i>	58.10	122		
<i>Race</i>		210	N/A	N/A
<i>White</i>	84.29	177		
<i>Non-White</i>	15.71	33		

Table 2
Covariates of Yoga Groups

	Yoga Group		
	Never (N=54*) Mean (S.D.)	Past (N= 45*) Mean (S.D.)	Current (N= 108*) Mean (S.D.)
Covariates			
<i>Body Mass Index</i>	24.70 ^a (4.71)	24.76 ^a (5.49)	23.65 ^a (4.01)
<i>Activity Level</i>	2.30 ^a (0.93)	2.40 ^a (0.84)	2.71 ^b (0.77)
<i>Age</i>	42.65 ^a (13.69)	39.17 ^{ab} (12.65)	37.61 ^b (11.71)
<i>Highest Level of Education</i>	4.96 ^a (1.33)	5.39 ^{ab} (1.02)	5.47 ^b (0.75)
<i>Number of Alternative Medicine Types Practiced</i>	2.00 ^a (2.24)	2.41 ^{ab} (2.20)	2.93 ^b (2.01)
<i>Race</i>	11 Non-White (20.8%) 42 White (79.2%)	2 Non-White (4.3%) 44 White (95.7%)	20 Non-White (18.3%) 89 White (81.7%)

* Due to missing data, there is some variability in N for each variable.

Note: Any means with a different superscript differ at the .05 level.

Table 3
Psycho-Social Variables of Yoga Groups

	Yoga Group***		
		Ever (N=153*)	
	Never (N=54*) Mean (S.D.)	Past (N= 45*) Mean (S.D.)	Current (N= 108*) Mean (S.D.)
Psycho-Social Variables			
<i>Internalization of the Thinness Ideal¹</i> ($\alpha = 0.75$)	3.38 (0.74)	3.58 (0.54)	
		3.58 (0.52)	3.57 (0.54)
<i>Social Comparison²</i> ($\alpha = 0.86$)	3.77 (0.82)	3.61 (0.78)	
		3.54 (0.68)	3.63 (0.82)
<i>Actual-Ideal Discrepancies³</i> ($\alpha = 0.73$)	1.29 (0.48)	1.12 (0.43)	
		1.07 (0.50)	1.13 (0.40)
<i>Self-Objectification⁴</i> (**)	-3.86 (14.01)	-6.51 (12.86)	
		-5.78 (12.89)	-6.82 (12.90)
<i>Body Satisfaction⁵</i> ($\alpha = 0.66$)	3.01 (0.69)	3.32 (0.78)	
		3.45 (1.08)	3.27 (0.62)
<i>Eating Disorder Symptomology⁶</i> ($\alpha = 0.87$)	2.38 (0.54)	2.37 (0.59)	
		2.34 (0.60)	2.39 (0.59)

* Due to missing data, there is some variability in N for each variable.

** The reliability coefficient could not be calculated for the Self-Objectification scale due to scale properties.

*** Participants were categorized into one of three yoga groups: never, past or current. Those who were either past or current yoga practitioners together constitute the ever yoga group.

¹ Scores on the measure of internalization of the thinness ideal could range from 1 to 5 with higher scores indicating a higher degree of internalizing the thin ideal.

² Scores on the measure of social comparison could range from 1 to 5 with higher scores indicating a tendency to compare oneself to others more often.

³ Scores on the measure of actual-ideal discrepancies could range from 0 to 3 with higher scores indicating greater actual-ideal disparities.

⁴ Scores on the measure of self-objectification could range from -25 to +25 with higher scores indicating a greater tendency to view one's body in appearance-based terms.

⁵ Scores on the measure of body satisfaction could range from 1 to 5 with higher scores being indicative of greater body satisfaction.

⁶ Scores on the measure of eating disorder symptomology could range from 1 to 6 with lower scores indicating fewer symptoms of eating disorders.

Table 4
Frequency Table: Months of Lifetime Practice of Current Yoga Group

	N	Percent	Cumulative Percent
<i>No. of Months of Lifetime Practice</i>			
<i>1</i>	9	9.0	9.0
<i>2</i>	9	9.0	18.0
<i>3</i>	3	3.0	21.0
<i>4</i>	2	2.0	23.0
<i>5</i>	1	1.0	24.0
<i>6</i>	4	4.0	28.0
<i>8</i>	1	1.0	29.0
<i>9</i>	1	1.0	30.0
<i>10</i>	2	2.0	32.0
<i>11</i>	1	1.0	33.0
<i>12</i>	10	10.0	43.0
<i>13</i>	1	1.0	44.0
<i>15</i>	1	1.0	45.0
<i>18</i>	2	2.0	47.0
<i>24</i>	1	1.0	48.0
<i>26</i>	3	3.0	51.0
<i>27</i>	2	2.0	53.0
<i>30</i>	2	2.0	55.0
<i>36</i>	6	6.0	61.0
<i>40</i>	1	1.0	62.0
<i>42</i>	2	2.0	64.0
<i>48</i>	9	9.0	73.0
<i>50</i>	1	1.0	74.0
<i>53</i>	1	1.0	75.0
<i>60</i>	7	7.0	82.0
<i>72</i>	3	3.0	85.0
<i>75</i>	1	1.0	86.0
<i>84</i>	1	1.0	87.0
<i>87</i>	1	1.0	88.0
<i>96</i>	3	3.0	91.0
<i>105</i>	1	1.0	92.0
<i>120</i>	4	4.0	96.0
<i>123</i>	1	1.0	97.0
<i>144</i>	2	2.0	99.0
<i>180</i>	1	1.0	100.0

Table 5
Frequency Table: Frequency of Practice of Current Yoga Group

	N	Percent	Cumulative Percent
<i>Frequency of Practice (No. of Sessions per Month or Week)</i>			
<i>1 = Less than 1 Day per Month</i>	28	25.93	25.93
<i>2 = 1 – 3 Days per Month</i>	28	25.93	51.85
<i>3 = 1 – 2 Days per Week</i>	36	33.33	85.19
<i>4 = 3 – 4 Days per Week</i>	10	9.26	94.44
<i>5 = 5 – 6 Days per Week</i>	5	4.63	99.07
<i>6 = 7 Days per Week</i>	1	0.93	100.00

Results of Analyses to Test Hypotheses

Hypotheses 1(a): Hypothesis 1(a) predicted that women who report a higher degree of yoga experience would report a lower degree of internalization of the thinness ideal. This hypothesis was tested by looking at the association between these two variables using two types of analyses. The independent groups *t*-test, and correlational analyses were conducted to explore this research hypothesis from a variety of perspectives.

In order to look at the differences in internalization of the thinness ideal between yoga groups, two separate *t*-tests were conducted; one *t*-test was used to compare the means of the never versus the ever yoga group, and a separate *t*-test was used to compare the never versus the current yoga group. The ever yoga group ($M=3.58$) internalized the thinness ideal more than the never yoga group ($M=3.38$). The difference was tested using an independent groups *t*-test and the difference was shown to be significant ($t = 2.12, p = .036$); this difference suggests a relationship that is opposite of that predicted. In a separate *t*-test analysis, there was a nonsignificant difference between the current yoga group ($M=3.57$) and the never yoga group ($M=3.38$) regarding internalization of the thinness ideal ($t = 1.92, p = .057$). Controlling for covariates did not change the significance of the analysis. Thus, the data fail to support the hypothesis that women with a higher degree of yoga experience report a lower tendency to internalize the thinness ideal and in fact suggests a relationship that is opposite of that predicted.

To determine whether there was a correlation between internalization of the thinness ideal and the degree of yoga experience among current practitioners of yoga, two separate analyses were conducted. One analysis looked at the correlation between

internalization of the thinness ideal and the number of months of lifetime practice and revealed a nonsignificant relationship ($r = .13, p = .189$). The second analysis evaluated the relationship between internalization of the thinness ideal and frequency of yoga practice and also revealed a nonsignificant relationship ($r = .05, p = .600$). These findings fail to support the hypothesis that women with a higher degree of yoga experience report a lower tendency to internalize the thinness ideal. Controlling for covariates did not change the significance of the analysis.

Hypothesis 1(b): Hypothesis 1(b) predicted that women who report a higher degree of yoga experience would report a lesser tendency to compare their physical appearance to those of others (social comparison). In a similar analysis to hypothesis 1(a), hypothesis 1(b) was tested by looking at the association between these two variables using the independent groups *t*-test and correlational analyses.

There was a nonsignificant difference between the ever yoga group ($M=3.61$) and the never yoga group ($M=3.77$) in their reported tendency for social comparison ($t = -1.32, p = .188$). Likewise, the difference between the current yoga group ($M=3.63$) and the never yoga group ($M=3.77$) regarding tendency for social comparison was also nonsignificant ($t = -1.02, p = .311$).

Correlational analysis revealed that there was a nonsignificant relationship between the degree of social comparison and the number of months of lifetime yoga practice ($t = .030, p = .765$) among current practitioners of yoga. The Pearson's correlation coefficient revealed that there was a significant inverse relationship between the degree of social comparison of current yoga participants and the frequency of practice ($t = -.206, p = .033$). However, regression analysis revealed that the relationship was

nonsignificant after controlling for other covariates (BMI, activity level, age, level of education, alternative medicine practice, and race) ($t = -.759, p = .449$). These findings fail to support hypothesis 1(b).

Hypothesis 1(c): Hypothesis 1(c) predicted that women who report a higher degree of yoga experience would report a lower degree of discrepancy between their actual and ideal physical body attributes. The ever yoga group ($M=1.12$) reported lower actual-ideal discrepancies than the never yoga group ($M = 1.29$) ($t = -2.54, p = .012$). Likewise, the current yoga group ($M=1.13$) reported lower actual-ideal discrepancies than the never yoga group ($t = -2.26, p = .025$). These differences were nonsignificant ($F = 1.01, p = .317$) when controlling for the covariates, particularly BMI ($F = 6.34, p = .013$), activity level ($F = 16.15, p < .001$), and race ($F = 10.35, p = .002$).

The correlational analysis of the degree of actual-ideal discrepancies among current practitioners of yoga to lifetime practice in months revealed a significant inverse relationship ($t = -.273, p = .006$). Regression analysis indicated that this relationship was marginally significant after controlling for the other covariates ($t = -1.91, p = .060$), indicating a suggestive trend towards support of the hypothesis that a higher degree of lifetime yoga experience is related to a lower degree of actual-ideal discrepancies. Table 6 (page 45) provides a model summary and coefficient values for this regression analysis. Alternatively, after controlling for covariates, the relationship between the degree of actual-ideal discrepancies and frequency of practice among the current yoga group was revealed to be nonsignificant ($t = -1.35, p = .180$). Thus, hypothesis 1(c) was only marginally supported.

Table 6
Regression Analysis of Actual-Ideal Discrepancies with Lifetime Practice and Covariates

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.447 ^a	.200	.146	.37582	.200	3.698	6	89	.003
2	.481 ^b	.231	.170	.37038	.032	3.635	1	88	.060
a. Predictors: (Constant), Race (White vs Non-White), Body Mass Index, Highest Level of Education, Age, No. of Alternative Medicine Styles Practiced, Activity Level									
b. Predictors: (Constant), Race (White vs Non-White), Body Mass Index, Highest Level of Education, Age, No. of Alternative Medicine Styles Practiced, Activity Level, Lifetime Practice in Months									

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.957	.539		1.776	.079
	Body Mass Index	.027	.014	.208	1.920	.058
	Activity Level	-.147	.060	-.263	-2.441	.017
	Age	-.002	.003	-.048	-.484	.630
	Highest Level of Education	-.068	.051	-.128	-1.337	.185
	No. of Alternative Medicine Styles Practiced	-.011	.020	-.059	-.574	.567
	Race (White vs Non-White)	.225	.111	.197	2.037	.045
2	(Constant)	.852	.534		1.595	.114
	Body Mass Index	.026	.014	.206	1.931	.057
	Activity Level	-.124	.061	-.223	-2.053	.043
	Age	.000	.003	-.021	-.215	.830
	Highest Level of Education	-.050	.051	-.095	-.990	.325
	No. of Alternative Medicine Styles Practiced	-.002	.020	-.010	-.095	.925
	Race (White vs Non-White)	.205	.110	.179	1.875	.064
	Lifetime Practice in Months	-.002	.001	-.194	-1.907	.060
a. Dependent Variable: Actual Ideal Discrepancies						

Hypothesis 1(d): Hypothesis 1(d) predicted that women who report a higher degree of yoga experience would report a lower tendency towards self-objectification. The difference between the ever yoga group ($M = -6.51$) and the never yoga group ($M = -3.86$) was not significantly different ($t = -1.21, p = .226$). Similarly, the current yoga group ($M = -6.82$) was not significantly different from the never yoga group ($t = -1.28, p = .204$) regarding the tendency towards self-objectification.

There was a nonsignificant relationship between the reported levels of self-objectification and months of lifetime practice among current practitioners of yoga, as demonstrated by the Pearson's correlation coefficient ($t = -.073, p = .496$). However, the analysis of the relationship between current yoga participants' reported levels of self-objectification and frequency of yoga practice revealed a significant inverse relationship ($t = -.315, p = .002$). Regression analysis revealed that this relationship remained significant after controlling for all covariates ($t = -2.34, p = .022$). This data supports the hypothesis that a higher degree of yoga experience is related to a lower degree of self-objectification in that participants who practiced yoga more frequently reported a lower tendency to self-objectify. Table 7 (page 47) provides a model summary and coefficient values for this regression analysis.

Hypothesis 2: Hypothesis 2 predicted that women who report a higher degree of yoga experience would report a higher degree of satisfaction with their physical appearance. The ever yoga group ($M=3.32$) and the current yoga group ($M=3.27$) both scored higher on a measure of body satisfaction than the never yoga group ($M=3.01$). Independent groups t-test revealed that both differences were significant ($t = 2.62, p = .010$) and ($t = 2.45, p = .015$) for the ever to never yoga group comparison and the current

Table 7
Regression Analysis of Self-Objectification with Frequency of Practice and Covariates

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.433 ^a	.187	.131	11.924	.187	3.307	6	86	.006
2	.486 ^b	.237	.174	11.625	.049	5.475	1	85	.022
a. Predictors: (Constant), Race (White vs Non-White), Age, Highest Level of Education, Activity Level, No. of Alternative Medicine Styles Practiced, Body Mass Index									
b. Predictors: (Constant), Race (White vs Non-White), Age, Highest Level of Education, Activity Level, No. of Alternative Medicine Styles Practiced, Body Mass Index, Frequency of Practice									

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.265	16.688		.076	.940
	Body Mass Index	.320	.356	.100	.901	.370
	Activity Level	-1.399	1.929	-.080	-.725	.470
	Age	-.443	.115	-.395	-3.857	.000
	Highest Level of Education	-.911	1.719	-.052	-.530	.598
	No. of Alternative Medicine Styles Practiced	-.499	.656	-.080	-.760	.449
	Race (White vs Non-White)	5.917	3.417	.176	1.731	.087
2	(Constant)	5.448	16.369		.333	.740
	Body Mass Index	.164	.353	.051	.465	.643
	Activity Level	-.217	1.948	-.012	-.112	.911
	Age	-.380	.115	-.339	-3.303	.001
	Highest Level of Education	-.801	1.676	-.046	-.478	.634
	No. of Alternative Medicine Styles Practiced	-.193	.653	-.031	-.296	.768
	Race (White vs Non-White)	5.428	3.338	.161	1.626	.108
	Frequency of Practice	-2.775	1.186	-.253	-2.340	.022
a. Dependent Variable: Self Objectification						

to never yoga group comparison, respectively. However, these differences were nonsignificant ($F = 2.29, p = .133$) when controlling for the covariates, particularly BMI ($F = 47.10, p < .001$), activity level ($F = 19.86, p < .001$), and race ($F = 4.67, p = .032$).
rCorrelational analysis revealed a significant positive relationship between body satisfaction and lifetime yoga practice in months ($t = .278, p = .005$) among current practitioners of yoga. The relationship remained significant after controlling for all covariates ($t = 2.45, p = .016$) as revealed by regression analysis. This supports the hypothesis that women with a higher degree of yoga experience in terms of lifetime practice report a higher degree of body satisfaction. Table 8 (page 49) provides a model summary and coefficient values for this regression analysis.

Correlational analysis revealed that a significant positive relationship existed between body satisfaction and frequency of current yoga practice ($t = .345, p < .001$). However, the relationship was nonsignificant after controlling for all covariates ($t = 1.14, p = .257$), particularly BMI ($t = -4.524, p < .001$) and activity level ($t = 3.10, p = .003$). Thus, hypothesis 2 is partially supported in that women with a higher degree of yoga experience in terms of lifetime practice, but not frequency of practice, reported a higher degree of body satisfaction.

Hypothesis 3: Hypothesis 3 predicted that women who report a higher degree of yoga experience would report a lesser degree of symptoms of eating disorders. There was no difference in scores between the ever yoga group ($M=2.37$) and the never yoga group ($M=2.38$) ($t = -.127, p = .899$) or between the current yoga group ($M=2.39$) and the never yoga group ($M=2.38$) ($t = .029, p = .977$).

Table 8
Regression Analysis of Body Satisfaction with Lifetime Practice and Covariates

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.632 ^a	.399	.359	.50142	.399	9.867	6	89	.000
2	.662 ^b	.438	.393	.48793	.038	5.989	1	88	.016
a. Predictors: (Constant), Race (White vs Non-White), Body Mass Index, Highest Level of Education, Age, No. of Alternative Medicine Styles Practiced, Activity Level									
b. Predictors: (Constant), Race (White vs Non-White), Body Mass Index, Highest Level of Education, Age, No. of Alternative Medicine Styles Practiced, Activity Level, Lifetime Practice in Months									

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.789	.720		6.654	.000
	Body Mass Index	-.090	.019	-.453	-4.796	.000
	Activity Level	.244	.081	.282	2.990	.004
	Age	.003	.004	.061	.703	.484
	Highest Level of Education	.017	.068	.021	.253	.801
	No. of Alternative Medicine Styles Practiced	.012	.027	.040	.448	.655
	Race (White vs Non-White)	-.169	.148	-.096	-1.144	.256
2	(Constant)	4.971	.704		7.058	.000
	Body Mass Index	-.089	.018	-.451	-4.904	.000
	Activity Level	.205	.081	.238	2.541	.013
	Age	.001	.004	.027	.318	.751
	Highest Level of Education	-.012	.067	-.015	-.182	.856
	No. of Alternative Medicine Styles Practiced	-.004	.027	-.014	-.153	.879
	Race (White vs Non-White)	-.135	.144	-.077	-.938	.351
	Lifetime Practice in Months	.003	.001	.213	2.447	.016
a. Dependent Variable: Body Satisfaction						

Correlational analysis revealed that the relationship between eating disorder symptomology and lifetime months of yoga practice was nonsignificant ($t = .032, p = .756$). There was also a nonsignificant relationship between eating disorder symptomology and frequency of yoga practice ($t = -.130, p = .181$). This data failed to support the hypothesis that women with a higher degree of yoga experience report a lower degree of eating disorder symptomology.

Summary of Hypotheses: In conclusion, this study failed to support a relationship between the degree of yoga experience and the reported levels of several psycho-social variables, including internalization of the thinness ideal (hypothesis 1(a)), tendency towards social comparison (hypothesis 1(b)), and symptoms of eating disorders (hypothesis 3). However, the data supported an association between the degree of yoga experience and the psycho-social variables, self-objectification (hypothesis 1(d)) and body satisfaction (hypothesis 2). The data indicated marginal support of an association between the degree of yoga experience and actual-ideal discrepancies (hypothesis 1(c)).

Specifically, the results of the study indicated that frequency of yoga practice was associated with a lower tendency to self-objectify, in that current yoga practitioners who reported the most frequent daily or monthly practice were more likely to consider physical abilities and competencies more important to their physical self-concept than appearance-related aspects. The data also indicated that a greater magnitude of lifetime practice of yoga was associated with body satisfaction, in that current yoga practitioners who reported the longest historical experience with yoga practice reported the greatest satisfaction with their bodily attributes. The data suggested that there may be a marginal relationship between a greater magnitude of lifetime practice of yoga and actual-ideal

discrepancies, in that current yoga practitioners who reported the longest historical experience with yoga practice reported fewer (marginally significant) discrepancies between their ideal and actual physical attributes such as facial features, breast size, and muscle tone.

Chapter Five: Discussion

The purpose of this thesis was to understand whether yoga practice, a mind-body exercise, was associated with a higher degree of body satisfaction and lower degree of eating disorder symptomology among women. Additionally, this study investigated whether yoga practice was associated with lower levels of antecedents to body dissatisfaction, including internalization of the thinness ideal, tendency to compare their physical appearance to those of others, discrepancies between actual and ideal physical attributes, and self-objectification, or the tendency to consider one's body from an appearance-based perspective rather than from a competence-based perspective. Overall, the results provide some support of the notion that yoga experience is associated with improved body satisfaction among women and how they think about and related to their bodies. The results of this study suggest that there is a relationship between body satisfaction and yoga experience, but the relationship may be more subtle than hypothesized.

Evaluation of Hypotheses

The results indicate that frequency of yoga practice is associated with a lower tendency to self-objectify, in that current yoga practitioners who reported the most frequent daily or monthly practice were more likely to consider physical abilities and competencies more important to their physical self-concept than appearance-related aspects. Additionally, the data indicate that a greater magnitude of lifetime practice of yoga is associated with body satisfaction, in that current yoga practitioners who reported the longest historical experience with yoga practice reported the greatest satisfaction with

their bodily attributes. The data suggest that there may be a marginal relationship between a greater magnitude of lifetime practice of yoga and actual-ideal discrepancies, in that current yoga practitioners who reported the longest historical experience with yoga practice reported fewer discrepancies between their ideal and actual physical attributes such as facial features, breast size, and muscle tone (results were marginally significant). These findings provide support of the notion that both historical experience with yoga, as well as shorter term intensity of yoga practice, may be related to how women view their bodies. Along with increased body satisfaction and decreased antecedents to body dissatisfaction, it was also hypothesized that yoga is associated with healthier eating attitudes. However, the data fail to support the hypothesis that yoga experience is related to symptoms of eating disorders.

The findings provide partial support of the hypotheses through the use of two different dosage measures, magnitude of lifetime practice measured in months, and frequency of practice measured in number of monthly or weekly practice sessions. Why did one dosage measure of yoga experience (magnitude of lifetime practice) provide support of the notion that yoga practice is related to body satisfaction, while another dosage measure of yoga (frequency of practice) provide support of the idea that yoga practice is related to decreased self-objectification? It is possible that decreased self-objectification is an initial benefit of yoga practice in that the more frequently one currently practices yoga, the more she will have a short-term effect from the high intensity, leading to appreciation of her body for what it is capable rather than how it appears. Body satisfaction may be a more long term effect that results from years of yoga practice, in that long-time practitioners may truly accept and embrace the two principles

of yoga, *self-acceptance and non-striving* and *body awareness and trust*. Perhaps it takes years of trusting one's body through the practice of yoga to truly accept it and be satisfied. This explanation is consistent with the concept that the tendency to self-objectify is an antecedent, or precursor, to body dissatisfaction, which has been suggested in the literature (Noll and Fredrickson, 1998) and was discussed previously in this thesis.

Although this study did not provide support of the notion that yoga experience is related to improved eating disorder symptoms, it is important to recall that eating concerns and disorders extend along a continuum ranging from mild dissatisfaction with one's body to serious eating disorders. An eating disorder, which is a behavior, is likely to develop only after having thoughts related to body dissatisfaction. As such, the attitudes and behaviors related to disordered eating are also likely to be the most difficult to improve and first may require an improvement of thoughts regarding one's body. Therefore, it is possible that there is indeed a relationship between yoga experience and improved eating attitudes, but that the relationship was not elucidated in this study due to any number of reasons, including the cross-sectional nature of the survey, or because of the small sample size and non-random sampling scheme.

Advantages of the Present Study

The present study has some distinct advantages in that the data collection controlled for variables that were likely to heavily confound. The survey asked women about their height and weight measurements so a measure of BMI could be computed. Women were also asked questions regarding their activity level, age, highest level of education completed, race, and experience with other forms of alternative medicine. The

results of this study that were significant found subtle relationships between yoga experience and the dependent variables even after controlling for these confounding variables.

Study Limitations

This study and proposed explanation of results has some limitations. First, the two principles of yoga, *self-acceptance and non-striving* and *body awareness and trust*, have been suggested by Daubenmier (2002), but are not necessarily globally accepted yoga principles by all practitioners. In order to accept the explanation above, one would need to accept that this yoga philosophy was promoted to all respondents in the current yoga group of this survey, and on a broader scale to the global field of yoga practitioners.

Another limitation of this study was the sampling scheme. The sampling approach for this study incorporated two methods, purposeful sampling and snowball sampling. The purposeful sampling involved selecting yoga studios for distribution based on the author's acquaintance with studio contacts. The snowball sampling also originated from the author's acquaintances for distribution. Since both of these methods did not use random sampling procedures, the results cannot be generalized to the population at large. Additionally, due to the nature of the sampling scheme, a response rate could not be established for this study because the author was not able to determine the number of potential participants approached and asked to complete the survey.

The methodology of this study was also a limitation for this thesis. First, the reliability of the self-objectification scale could not be determined because of the complexity of scale properties. Therefore, a Cronbach's alpha coefficient could not be

calculated and there is no way of knowing whether the measure is reliably measuring the concept of self-objectification. However, based on previous studies (Noll, 1997), the measure was found to have sufficient construct validity and correlated positively with other measures of preoccupations with appearance, a related concept.

Additionally, the measures of yoga adherence have some limitations. First, the measure is based on self-reports of both current and historical yoga practice. It is possible that yoga practitioners who have practiced for a long time do not remember the number of years and months they have in fact practiced yoga. It is also possible that participants do not recall how frequently they practice yoga and either overestimate or underestimate their frequency of practice. Second, the yoga adherence measures were designed for use in this thesis and have not been validated or used in any other studies.

The findings of this study suggest a relationship between the degree of yoga experience among current yoga practitioners and self-objectification and body satisfaction. However, since the analyses were correlational in nature, there is no evidence regarding a cause and effect relationship between yoga and improved body satisfaction. It is indeed possible that yoga practice causes improved body satisfaction among women. However, it is equally possible that women who view their bodies based on their capabilities, and those who are satisfied with their bodies, are actually drawn to yoga in the first place based on any of a number of reasons. Perhaps women who are not satisfied with their bodies avoid yoga classes where their bodies may be on display for others to watch them. Alternatively, perhaps women who are dissatisfied with their bodies spend their time doing more rigorous and body-oriented exercises in order to burn

calories, rather than yoga, a mind-body form of exercise. The cause and effect relationship between yoga and body satisfaction should be investigated in future research.

Recommendations for Future Research

This study builds on the data collected by Daubenmier (2002) and contributes to the body of research on body satisfaction and yoga experience in a significant way due to the robustness of controlling for several covariates. Recommendations for future research include more studies testing the dependent variables analyzed in this study in relation to yoga experience, and more in-depth analysis of the role that both historical experience with yoga, and current intensity of yoga experience, play. Future studies would also benefit from a larger sample size than the present study to increase power.

It is important to note that BMI, activity level, and race were the most consistent confounders in this study and future research should control for these factors. Future research may help elucidate the reason that these factors are confounding when looking at the relationship between body satisfaction and yoga experience. For example, BMI may be highly confounding when investigating yoga because women may seek out yoga only once they are satisfied with their weight. Since yoga is a form of exercise that burns a lower number of calories when compared to other higher intensity forms of exercise (i.e., running or swimming), women who are not satisfied with their bodies because they are overweight may choose to invest their time doing something that will help them to lose weight. Asking women why they do or do not practice yoga could help to uncover the role that yoga plays in women's body satisfaction.

There are other methodological approaches that may be chosen to test the relationship between yoga experience and body satisfaction. While this study incorporated a quantitative approach to data collection, a qualitative approach may provide additional insight into the cognitive process that is part of women's yoga practice. Future research could explore this cognitive process by investigating what the experience of yoga practice does for women. Some women may practice yoga by simply going through the motions of yoga poses and postures, while other women may accept the mind-body connection and the principles of yoga discussed in this thesis. There also may be a difference between women who continue their practice of yoga and women who choose to quit. Perhaps women who stick with yoga are those who embrace the principles of yoga. Qualitative research could help to elucidate these differences in cognitive processing among female yoga practitioners.

While this study focused on yoga practice as a possible intervention for the precursors to body dissatisfaction and symptoms of eating disorders, there may be other interventions to help women with poor body satisfaction or eating attitudes using the principles of yoga. It is possible that there is a broader theoretical system which includes yoga, but of which yoga is not the only component. If yoga is indeed one part of a broader scheme which incorporates the principles discussed, future research is needed to elucidate that system. For example, perhaps the principles of yoga could be taught as part of meditation or through classroom education of concepts. Therapeutic studies comparing yoga intervention to other interventions that may help eating behaviors and body satisfaction should be conducted.



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October 24, 2007

MEMORANDUM

Application Approval Notification

To: Dr. Kenneth Beck
Carrie Lawlor
Department of Health and Human Performance

From: Roslyn Edson, M.S., CIP 
IRB Manager
University of Maryland, College Park

Re: **IRB Application Number: 07-0539**
Project Title: "Relationships of Yoga Experience to Body Satisfaction and Eating Attitudes"

Approval Date: October 21, 2007

Expiration Date: October 21, 2010

Type of Application: New Project

Type of Research: Exempt

**Type of Review
For Application:** Exempt

The University of Maryland, College Park Institutional Review Board (IRB) approved your IRB application. The research was approved in accordance with 45 CFR 46, the Federal Policy for the Protection of Human Subjects, and the University's IRB policies and procedures. Please reference the above-cited IRB application number in any future communications with our office regarding this research.

Recruitment/Consent: For research requiring written informed consent, the IRB-approved and stamped informed consent document is enclosed. The IRB approval expiration date has been stamped on the informed consent document. Please keep copies of the consent forms used for this research for three years after the completion of the research.

Continuing Review: If you intend to continue to collect data from human subjects or to analyze private, identifiable data collected from human subjects, after the expiration date for this approval (indicated above), you must submit a renewal application to the IRB Office at least 30 days before the approval expiration date.

Modifications: Any changes to the approved protocol must be approved by the IRB before the change is implemented, except when a change is necessary to eliminate apparent immediate hazards to the subjects. If you would like to modify the approved protocol, please submit an addendum request to the IRB Office. The instructions for submitting a request are posted on the IRB web site at:
http://www.umresearch.umd.edu/IRB/irb_Addendum%20Protocol.htm.

(continued)

Appendix A

Unanticipated Problems Involving Risks: You must promptly report any unanticipated problems involving risks to subjects or others to the IRB Manager at 301-405-0678 or redson@umresearch.umd.edu.

Student Researchers: Unless otherwise requested, this IRB approval document was sent to the Principal Investigator (PI). The PI should pass on the approval document or a copy to the student researchers. This IRB approval document may be a requirement for student researchers applying for graduation. The IRB may not be able to provide copies of the approval documents if several years have passed since the date of the original approval.

Additional Information: Please contact the IRB Office at 301-405-4212 if you have any IRB-related questions or concerns.

SURVEY ON WOMEN AND BODY SATISFACTION

Dear Participant,

My name is Carrie Lawlor and I am a graduate student at the University of Maryland School of Public Health in the Department of Public and Community Health. I am interested in learning about how women think about their bodies and themselves more generally. This study will help researchers better understand about women and their body satisfaction. My research has been approved by the University's Institutional Review Board.

If you are a woman 18 years of age or older and you are willing to fill out a survey on women and body satisfaction, I would greatly appreciate it! Please know that the survey is completely anonymous. Please do not put any identifying information, such as your name, anywhere on the survey. No one other than me will see your responses. Findings will be described for the entire group of participants; no individual information will be reported.

Your participation is voluntary and you may skip any item you do not wish to answer. There are no known risks associated with participating in this research project. It is likely the survey will take 10-15 minutes to complete. I hope you will participate in my research – I wouldn't be able to do this study without you! Because of your help, researchers may come to better understand factors that influence body satisfaction among women. Please do not hesitate to call me with any questions or comments you may have about the study.

Contact information:

**Carrie Lawlor
xxxxxx@xxxxxxxxxx
(xxx) xxx-xxxx**

The University of Maryland's Institutional Review Board Office can be reached at (301) 405-0678 or irb@deans.umd.edu, if you have any questions about your rights as a research participant.

Thank you for participating in the study and helping me finish my Master's degree!

Sincerely,

Carrie Lawlor

Appendix B

INSTRUCTIONS: For items 1 through 6, use this 1 to 5 point scale to indicate what you think attractive women look like. For example, for item 1, if you disagree that slender women are more attractive, you would place a “2” in the space provided.

1	2	3	4	5
<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>

- _____ 1. Slender women are more attractive.
- _____ 2. Women who are in shape are more attractive.
- _____ 3. Tall women are more attractive.
- _____ 4. Women with toned (lean) bodies are more attractive.
- _____ 5. Shapely women are more attractive.
- _____ 6. Women with long legs are more attractive.

INSTRUCTIONS: For items 7 through 9, use this 1 to 5 point scale to indicate how often you compare yourself to others.

1	2	3	4	5
<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Often</i>	<i>Always</i>

- _____ 7. I compare my physical appearance to the physical appearance of others.
- _____ 8. I compare how I am dressed to how other people are dressed.
- _____ 9. I compare my figure to the figures of other people.

Appendix B

INSTRUCTIONS: For items 10 through 17, use this 1 to 5 point scale to indicate how dissatisfied or satisfied you are with each of the following areas or aspects of your body.

1	2	3	4	5
<i>Very Dissatisfied</i>	<i>Mostly Dissatisfied</i>	<i>Neither Satisfied Nor Dissatisfied</i>	<i>Mostly Satisfied</i>	<i>Very Satisfied</i>

- _____ 10. Face
- _____ 11. Hair
- _____ 12. Lower torso (e.g., hips, thighs)
- _____ 13. Mid-torso (e.g., stomach, waist)
- _____ 14. Upper torso (e.g., chest, breasts)
- _____ 15. Muscle tone
- _____ 16. Weight
- _____ 17. Overall appearance

INSTRUCTIONS: For each characteristic in items 18 through 27, think about how you would describe yourself as you actually are. Then think about how you wish you were. The difference between the two reveals how close you come to your personal ideal. For each item, use the 0 to 3 point scale below to rate how much you resemble your personal physical ideal.

0	1	2	3
<i>Exactly As I Am</i>	<i>Almost As I Am</i>	<i>Fairly Unlike Me</i>	<i>Very Unlike Me</i>

18. My ideal **height** is: _____
19. My ideal **skin complexion** is: _____
20. My ideal **hair texture and thickness** is: _____
21. My ideal **facial features** are: _____
22. My ideal **muscle tone and definition** is: _____
23. My ideal **body proportions** are: _____
24. My ideal **weight** is: _____
25. My ideal **chest/breast size** is: _____
26. My ideal **physical strength** is _____
27. My ideal **physical coordination** is: _____

Appendix B

INSTRUCTIONS: For items 28 through 53, use this 1 to 6 point scale to indicate how frequently you feel or do the indicated thoughts or actions.

1	2	3	4	5	6
<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Often</i>	<i>Usually</i>	<i>Always</i>

- _____ 28. I am terrified about being overweight.
- _____ 29. I avoid eating when I am hungry.
- _____ 30. I find myself preoccupied with food.
- _____ 31. I have gone on eating binges where I feel that I may not be able to stop.
- _____ 32. I cut my food into small pieces.
- _____ 33. I am aware of the calorie content of foods that I eat.
- _____ 34. I particularly avoid food with a high carbohydrate content (i.e., bread, rice, potatoes, etc.)
- _____ 35. I feel that others would prefer if I ate more.
- _____ 36. I vomit after I have eaten.
- _____ 37. I feel extremely guilty after eating.
- _____ 38. I am preoccupied with a desire to be thinner.
- _____ 39. I think about burning up calories when I exercise.
- _____ 40. Other people think that I am too thin.
- _____ 41. I am preoccupied with the thought of having fat on my body.
- _____ 42. I take longer than others to eat my meals.
- _____ 43. I avoid foods with sugar in them.
- _____ 44. I eat diet foods.
- _____ 45. I feel that food controls my life.
- _____ 46. I display self control around food.
- _____ 47. I feel that others pressure me to eat.
- _____ 48. I give too much time and thought to food.
- _____ 49. I feel uncomfortable after eating sweets.
- _____ 50. I engage in dieting behavior.
- _____ 51. I like my stomach to be empty.
- _____ 52. I enjoy trying new rich foods.
- _____ 53. I have the impulse to vomit after meals.

INSTRUCTIONS: The items below identify 10 different attributes of your body. Please rank order these body attributes from the one that has the greatest impact on how you think about your body to the one that has the least impact. It does not matter how you describe yourself in terms of each attribute. For example, fitness level can have a great impact on how you think about your body regardless of whether you consider yourself to be physically fit or not. Please read over all of the attributes, then, record your rank by bubbling in the letter of the attribute.

WHEN YOU THINK ABOUT YOUR BODY, HOW IMPORTANT IS ...

- | | |
|-----------------------------|---|
| A. Physical Coordination? | G. Energy level (e.g., stamina)? |
| B. Health? | H. Firm/sculpted muscles? |
| C. Weight? | I. Physical Fitness level? |
| D. Strength? | J. Measurements (e.g., chest, waist, hips)? |
| E. Sex appeal? | |
| F. Physical Attractiveness? | |

(Be sure to mark each row and each column only once!)

	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>	<u>H</u>	<u>I</u>	<u>J</u>
Most Important	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>
2 nd Most Important	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>
3 rd Most Important	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>
4 th Most Important	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>
5 th Most Important	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>
6 th Most Important	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>
7 th Most Important	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>
8 th Most Important	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>
9 th Most Important	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>
Least Important	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>

INSTRUCTIONS: For the remainder of the items, please circle the corresponding answers or fill in the blanks as appropriate.

1. In your lifetime have you ever practiced yoga? (circle):
 - a. Yes (Go to Question 2)
 - b. No (Skip to Question 6)
2. Have you practiced yoga in the past 12 months? (circle):
 - a. Yes (Go to Question 3)
 - b. No (Skip to Question 6)
3. **If you have practiced yoga in the past 12 months**, what is the total time you have practiced yoga in your lifetime? Please approximate by filling in the number of months and years. Please put “0” for years, if you have practiced less than one year.

_____ years and _____ months
4. **If you have practiced yoga in the past 12 months**, how frequently, on average, do you practice yoga? (circle):

a. less than 1 day per month	d. 3 to 4 days per week
b. 1 to 3 days per month	e. 5 to 6 days per week
c. 1 to 2 days per week	f. 7 days per week
5. What is the duration of your typical yoga practice in minutes? (fill in the blank)

6. What is your activity level? (circle):
 - a. Sedentary (little or no exercise)
 - b. Lightly Active (light exercise/sports 1-3 days/week)
 - c. Moderately Active (moderate exercise/sports 3-5 days/week)
 - d. Very Active (hard exercise/sports 6-7 days/week)
 - e. Extra Active (very hard daily exercise/sports & physical job or 2X day training)
7. Age: (fill in blank) _____
8. What is your weight in pounds? (fill in blank) _____
9. What is your height in feet and inches? (fill in blank) _____

Appendix B

10. Have you practiced **any of the following in the past 12 months**: (circle all that apply):
- | | |
|--------------------------|------------------------------------|
| a. Meditation | k. Megavitamins |
| b. Relaxation techniques | l. Commercial weight loss programs |
| c. Chiropractic care | m. Lifestyle diets |
| d. Massage | n. Aromatherapy |
| e. Herbs | o. Hypnosis |
| f. Imagery | p. Acupuncture |
| g. Self-help groups | q. Biofeedback |
| h. Energy healing | r. Naturopathy |
| i. Homeopathy | s. None of the above |
| j. Folk remedies | |
11. What is your highest level of education completed? (circle):
- | | |
|------------------------|--------------------------------|
| a. Some High School | e. Bachelor Degree |
| b. High School Diploma | f. Advanced Degree |
| c. Some College | g. Other: (fill in the blank): |
| d. Associate degree | _____ |
12. What is your race? (circle all that apply):
- | | |
|-------------------------------------|--|
| a. American Indian or Alaska Native | d. Native Hawaiian or Other Pacific Islander |
| b. Asian | e. White |
| c. Black or African American | f. Other: (fill in blank) _____ |
13. What is your ethnicity? (circle):
- | |
|---------------------------|
| a. Hispanic or Latino |
| b. Not Hispanic or Latino |

**You Are Finished With This Survey.
Thank You So Much For Your Participation!**

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